

WHAT IS CLAIMED IS:

1. A cleaning unit that cleans residual toner on a surface of an image carrier in an image forming apparatus, comprising:
a cleaning blade that is in contact with the surface of the image carrier, wherein an amplitude of a waveform at an edge of the cleaning blade is not greater than 40 μm with respect to a downstream side of a direction of movement of the image carrier.
2. The cleaning unit according to claim 1, wherein a nip width of the cleaning blade is in a range of 5 μm to 30 μm .
3. The cleaning unit according to claim 1, wherein a stick width in a stick-slip phenomenon that occurs when the cleaning blade is in contact with the image carrier is not greater than 200 μm .
4. The cleaning unit according to claim 1, wherein the cleaning blade is in a counter form with respect to rotation of the image carrier and an angle of contact at which the cleaning blade is in contact with the image carrier is in a range of 5 degrees to 25 degrees.
5. The cleaning unit according to claim 1, wherein a hardness of the cleaning blade is in a range of 65 degrees to 85 degrees (JIS-A).

6. The cleaning unit according to claim 1, further comprising an arrangement that presses the cleaning blade and the image carrier toward each other at a pressure in a range of 10 gf/cm to 60 gf/cm.
- 5 7. The cleaning unit according to claim 1, wherein a peak temperature of a loss tangent $\tan \delta$ of the cleaning blade is in a range of -30°C to 2°C .
8. The cleaning unit according to claim 1, wherein a rate of change
10 of loss tangent $\tan \delta$ corresponding to a temperature in a range of 10°C to 50°C , is in a range of 0.001 per degree to 0.020 per degree.
9. A process cartridge in an image forming apparatus, the process cartridge comprising:
- 15 a cleaning unit that includes
- a cleaning blade that is in contact with a surface of an image carrier and that cleans residual toner from the surface, wherein an amplitude of a waveform at an edge of the cleaning blade is not greater than $40\text{ }\mu\text{m}$ with respect to a downstream side of a direction of
20 movement of the image carrier; and
- at least one selected from
- an image carrier;
- a charging unit that charges a surface of the image carrier uniformly; and
- 25 an exposing unit that writes a latent image on the

surface of the image carrier.

10. The process cartridge according to claim 9, wherein a nip width of the cleaning blade is in a range of 5 μm to 30 μm .

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11. The process cartridge according to claim 9, wherein stick width in a stick-slip phenomenon that occurs when the cleaning blade is in contact with the image carrier is not greater than 200 μm .

10 12. The process cartridge according to claim 9, wherein the cleaning blade is in a counter form with respect to rotation of the image carrier and an angle of contact at which the cleaning blade is in contact with the image carrier is in range of 5 degrees to 25 degrees.

15 13. The process cartridge according to claim 9, wherein a hardness of the cleaning blade is in a range of 65 degrees to 85 degrees (JIS-A).

14. The process cartridge according to claim 9, further comprising an arrangement that presses the cleaning blade and the image carrier
20 toward each other at a pressure in a range of 10 gf/cm to 60 gf/cm.

15. The process cartridge according to claim 9, wherein a peak temperature of a loss tangent $\tan \delta$ of the cleaning blade is in a range of -30°C to 2°C .

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16. The process cartridge according to claim 9, wherein a rate of change of loss tangent $\tan \delta$ corresponding to a temperature in a range of 10°C to 50°C, is in a range of 0.001 per degree to 0.020 per degree.
- 5 17. The process cartridge according to claim 9, wherein a coefficient of static friction of the surface of the image carrier is in a range of 0.1 to 0.4.
- 10 18. The process cartridge according to claim 9, comprising the image carrier, wherein a peripheral speed of the rotation of the image carrier is not less than 180 mm/sec.
- 15 19. The process cartridge according to claim 9, comprising the developing unit, wherein a volume average particle size of the toner that is supplied by the developing unit to the surface of the image carrier is in a range of 3 μm to 8 μm and percentage content of number of toner in a range of 0.6 μm to 2.0 μm is not less than 10 percent.
- 20 20. The process cartridge according to claim 9, comprising the developing unit, wherein a ratio D_v/D_n of a volume average particle size and a number average particle size of the toner that is supplied by the developing unit to the surface of the image carrier is in a range of 1.05 to 1.40.

21. The processing cartridge according to claim 9, comprising the developing unit, wherein a shape factor SF-1 of the toner that is supplied by the developing unit to the surface of the image carrier is in a range of 100 to 180 and a shape factor SF-2 of the toner is in a range of 100 to 190.

22. A image forming apparatus comprising a process cartridge, the process cartridge including

a cleaning unit that has

a cleaning blade that is in contact with a surface of an image carrier and that cleans residual toner from the surface, wherein an amplitude of a waveform at an edge of the cleaning blade is not greater than 40 μm with respect to a downstream side of a direction of movement of the image carrier; and

at least one selected from

an image carrier;

a charging unit that charges a surface of the image carrier uniformly; and

an exposing unit that writes a latent image on the surface of the image carrier.

23. The image forming apparatus according to claim 22, wherein a nip width of the cleaning blade is in a range of 5 μm to 30 μm .

24. The image forming apparatus according to claim 22, wherein stick width in a stick-slip phenomenon that occurs when the cleaning blade is in contact with the image carrier is not greater than 200 μm .
- 5 25. The image forming apparatus according to claim 22, wherein the cleaning blade is in a counter form with respect to rotation of the image carrier and an angle of contact at which the cleaning blade is in contact with the image carrier is in range of 5 degrees to 25 degrees.
- 10 26. The image forming apparatus according to claim 22, wherein a hardness of the cleaning blade is in a range of 65 degrees to 85 degrees (JIS-A).
- 15 27. The image forming apparatus according to claim 22, further comprising an arrangement that presses the cleaning blade and the image carrier toward each other at a pressure in a range of 10 gf/cm to 60 gf/cm.
- 20 28. The image forming apparatus according to claim 22, wherein a peak temperature of a loss tangent $\tan \delta$ of the cleaning blade is in a range of -30°C to 2°C .
- 25 29. The image forming apparatus according to claim 22, wherein a rate of change of loss tangent $\tan \delta$ corresponding to a temperature in a range of 10°C to 50°C , is in a range of 0.001 per degree to 0.020 per

degree.

30. The image forming apparatus according to claim 22, wherein a
coefficient of static friction of the surface of the image carrier is in a
5 range of 0.1 to 0.4.

31. The image forming apparatus according to claim 22, comprising
the image carrier, wherein a peripheral speed of the rotation of the
image carrier is not less than 180 mm/sec.

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32. The image forming apparatus according to claim 22, comprising
the developing unit, wherein a volume average particle size of the toner
that is supplied by the developing unit to the surface of the image
carrier is in a range of 3 μm to 8 μm and percentage content of number
15 of toner in a range of 0.6 μm to 2.0 μm is not less than 10 percent.

33. The image forming apparatus according to claim 22,
comprising the developing unit, wherein a ratio D_v/D_n of a volume
average particle size and a number average particle size of the toner
20 that is supplied by the developing unit to the surface of the image
carrier is in a range of 1.05 to 1.40.

34. The image forming apparatus according to claim 22, comprising
the developing unit, wherein a shape factor SF-1 of the toner that is
25 supplied by the developing unit to the surface of the image carrier is in

a range of 100 to 180 and a shape factor SF-2 of the toner is in a range of 100 to 190.